

BISON CONTROL AREA
PROGRAM
ANNUAL REPORT
DECEMBER 2012 – APRIL 2013

South Slave Region

Environment and Natural Resources
Government of the Northwest Territories

2015

Manuscript Report No. 248

The contents of this paper are the sole responsibility of the author.

ABSTRACT

Many bison in Wood Buffalo National Park and the Slave River Lowlands are infected with bovine tuberculosis and brucellosis while both the Nahanni and Mackenzie bison populations are free of these livestock diseases. To help protect the disease-free status of these two populations, the Government of the Northwest Territories implemented the Bison Control Area (BCA) program in 1987 with the objective of reducing probability of disease transmission between herds by preventing bison from moving through or establishing herds within the area south of the Mackenzie River between the Trout and Buffalo Rivers. To keep this area free of bison, aerial surveys are flown to search for bison, and public participation by reporting any sightings or signs of bison is encouraged.

This program continued through the 2012/2013 season with 12 weekly shoreline patrols, one investigation flight, a semi-comprehensive survey, and a comprehensive survey. In total, 92.7 hrs were spent flying these surveys in fixed-wing aircraft over 22 days.

During the 2012/2013 season, there were three reports of bison in or approaching the BCA. All three reports were investigated and no action was required.

TABLE OF CONTENTS

ABSTRACT.....	iii
LIST OF FIGURES	v
LIST OF TABLES.....	vi
INTRODUCTION	1
METHODS	3
RESULTS	9
SHORELINE PATROLS	9
TRANSECT SURVEYS.....	12
PUBLIC AWARENESS.....	17
BISON REPORTS	17
DISCUSSION	19
ACKNOWLEDGEMENTS.....	22
LITERATURE CITED	23
APPENDIX A: SUMMARY OF SURVEILLANCE ACTIVITIES AND REMOVALS OF BISON FROM THE NORTHWEST TERRITORIES BISON CONTROL AREA (1988/1989 – 2011/2012).....	24
APPENDIX B: WEATHER CONDITIONS DURING THE BCA PROGRAM, SEASON 2012-2013	26
APPENDIX C: BEARFACTS NEWSLETTER: JUNE 29, 2012.....	28
APPENDIX D: 2012-2013 BCA EXPENSES	31
APPENDIX E: BIBLIOGRAPHY	32

LIST OF FIGURES

Figure 1. The current distribution of bison (<i>Bison bison</i>) in northern Canada.	2
Figure 2. The Bison Control Area and its stratification into three zones.	4
Figure 3. Comprehensive survey crew.	5
Figure 4. The approximate route followed for the weekly shoreline surveys is indicated with a blue dotted line.	6
Figure 5. Routes followed during the semi-comprehensive survey.	7
Figure 6. Routes followed during the comprehensive survey.	7
Figure 7. Recorded observations of bison during the shoreline patrols.	11
Figure 8. All bison and bison track observations recorded during the semi-comprehensive survey, February 5-19, 2013.	15
Figure 9. All bison and bison track observations recorded during the comprehensive survey, March 18-20, 2013.	16
Figure 10. Number of bison observer during shoreline patrols.	20

LIST OF TABLES

Table 1. All recorded observations of animals and tracks seen during the shoreline surveys.	10
Table 2. Summary of BCA Shoreline surveys for the 2012/2013 season.....	11
Table 3. All recorded observations of animals and tracks seen during the semi-comprehensive survey, February 5-16, 2013.....	13
Table 4. Summary of BCA transect surveys for the 2012/2013 season.....	13
Table 5. All recorded observations of animals and tracks seen during the comprehensive survey, March 18-20, 2013.	14
Table 6. Comparison of current and prior observation counts.....	20

INTRODUCTION

The history of wood bison in the Northwest Territories (NWT) and the disease status of bison herds in the NWT are reviewed in previous annual reports on the Bison Control Area (BCA) (e.g. Sayine-Crawford et al. 2012, Greig and Cox 2012). Additional literature sources are listed in the bibliography in Appendix e.

The BCA was established in 1987 to reduce the risk of bovine tuberculosis and brucellosis infected bison in the Slave River Lowlands (SRL) and Wood Buffalo National Park (WBNP) coming in contact with disease-free bison in the Mackenzie, Nahanni and Hay-Zama (Alberta) populations (Figure 1). The BCA is intended to be a buffer zone between infected and uninfected populations where bison are prevented from becoming established. This zone encompasses over 39,800 km² bounded in the south by the NWT border, in the north by the Mackenzie River and Great Slave Lake, in the west by the Trout River and in the east by the Buffalo River. All bison found within the BCA are assumed to be diseased and are removed and tested.

Since 1993 the bison control program has been jointly funded by the Government of the Northwest Territories [Environment and Natural Resources (ENR)] and the Government of Canada (Parks Canada Agency). Both governments realize the importance of maintaining healthy wood bison herds and promoting the growth of the species.

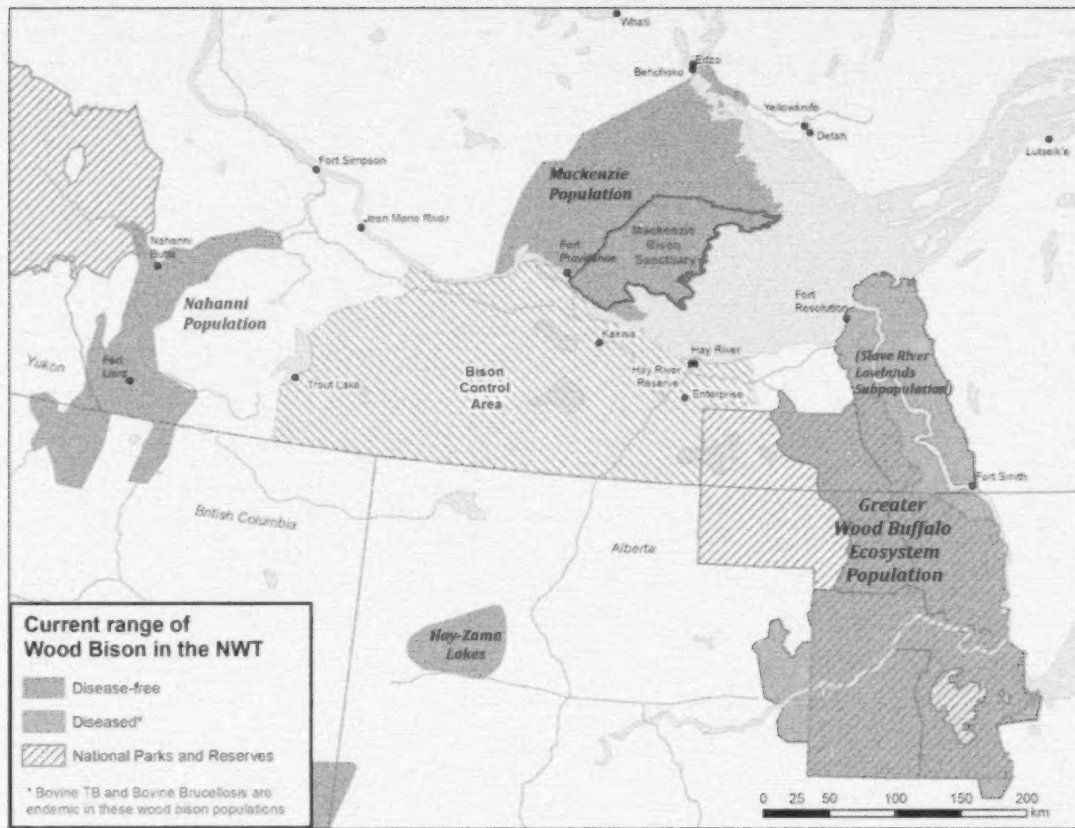


Figure 1. The current distribution of bison (*Bison bison athabascæ*) in northern Canada. All populations are wood bison.

The objectives of the BCA program are to prevent bison from moving between the SRL/WBNP and the Mackenzie, Nahanni and Hay-Zama populations by detecting and removing any bison that may come into the area. To achieve this we:

- Conduct aerial surveillance of the BCA during the winter months;
- Maintain the BCA free of bison and prevent any herds from establishing within its limits;
- Increase public awareness about the program; and
- Confirm disease status of any bison found in the BCA.

METHODS

Survey methodology was similar to that used in previous years (Gates et al. 1992, Williamson et al. 1995, Bohnet and Gates 1997, Nishi 2002, Boulanger et al. 2002, Bidwell et al. 2004, Campbell et al. 2004, Hartop et al. 2009) to ensure repeatability and comparability of wildlife sightings. The exception to this is that transect markers were not used on the windows or wings since the purpose of the BCA program is to determine presence/absence of bison and is not to conduct a population survey.

The BCA is stratified into three zones (Figure 2). Zone I is the area in which bison are most likely to be seen, since it is the section of the BCA that is nearest to both the Mackenzie Bison Sanctuary and WBNP. Therefore, the program focuses on this particular zone, with more frequent aerial surveillance in the form of weekly shoreline patrols. Zone II is a larger zone and is only surveyed twice a year during semi-comprehensive and comprehensive surveys. Surveillance of Zone III relies on reports from people living and travelling in the area instead of aerial surveys.

Aerial surveillance is conducted during the winter months when bison and signs of their presence (feeding craters and tracks) are most visible. Also, the probability of bison moving through the BCA is the greatest in the winter because we assume bison are more likely to walk across the frozen Mackenzie River than swim across it in the summer.

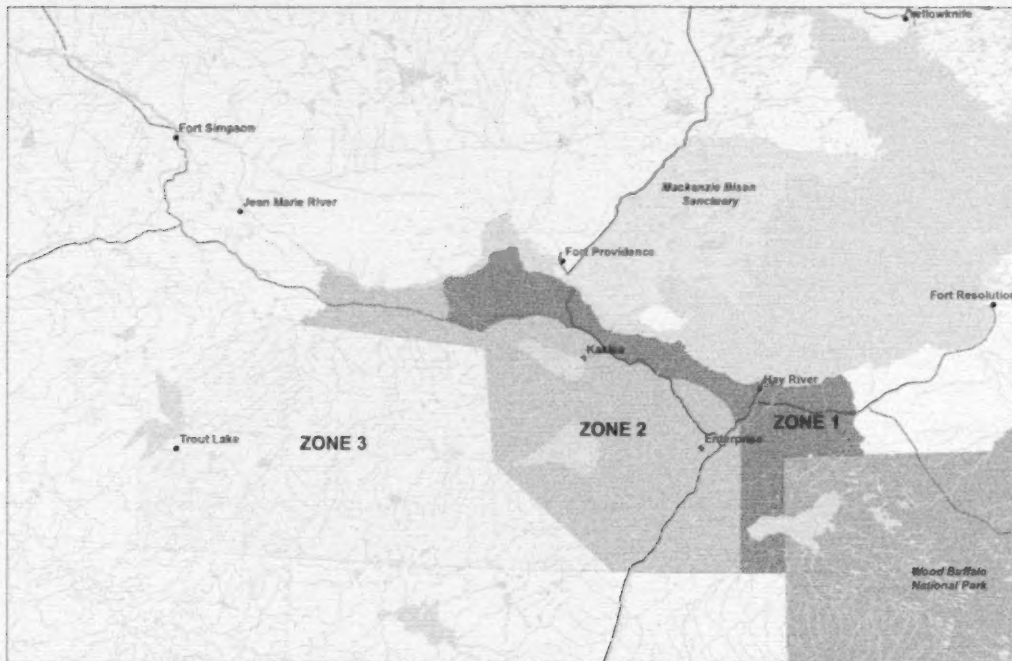


Figure 2. The Bison Control Area and its stratification into three zones.

All flights from January 4 - March 15 were conducted with a Cessna 185 while all flights after that were conducted with a Cessna 337 (Figure 3). Both aircraft were from Landa Aviation. Shoreline patrols were conducted with a pilot and a Renewable Resources Officer from Fort Providence. The Wildlife Technician from the ENR office in Fort Smith conducted the semi-comprehensive survey and the comprehensive survey. Community observers, Renewable Resources Officers, and ENR staff assisted with the semi-comprehensive and comprehensive surveys. During all surveys the aircraft flew 150-250 m AGL and at speeds of 180-220 km/h.



Figure 3. Comprehensive survey crew (left to right): Pat Martel, Darcy King, John Mandeville, and Karl Cox.

Shoreline patrols occurred throughout the period when river crossings on ice were possible, with an interval of around seven days. These patrols were flown along the Mackenzie River's shores between Pointe Desmarais and Axe Point and took approximately three hours to complete (Figure 4). Patrols ended when reduced snow cover made bison and their tracks difficult to see, and ice conditions on the Mackenzie River deteriorated to the point where crossing by bison became less likely than in mid-winter.

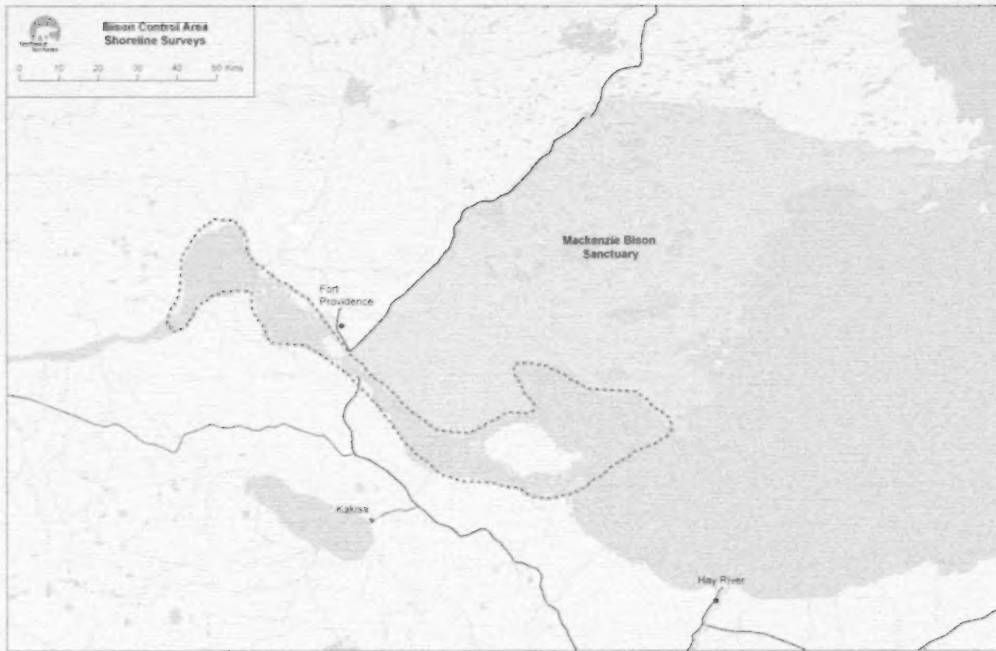


Figure 4. The approximate route followed for the weekly shoreline surveys is indicated with a blue dotted line.

A semi-comprehensive survey covering Zones I and II was flown in February 2013 (Figure 5) and a comprehensive survey was flown in March 2013, also covering Zones I and II but at a higher intensity (Figure 6). This year the semi-comprehensive survey was combined with a series of reconnaissance flights for boreal caribou (for a collaring program). The combining of programs allowed us to share costs and provide better coverage for both the caribou and BCA programs. Due to the extensive coverage of the semi-comprehensive survey, the comprehensive survey area in the zone II section of the BCA was reduced (specifically, the portion of Zone II west of Highway 1 was not re-surveyed). Zone I was surveyed with the same intensity as in prior years.

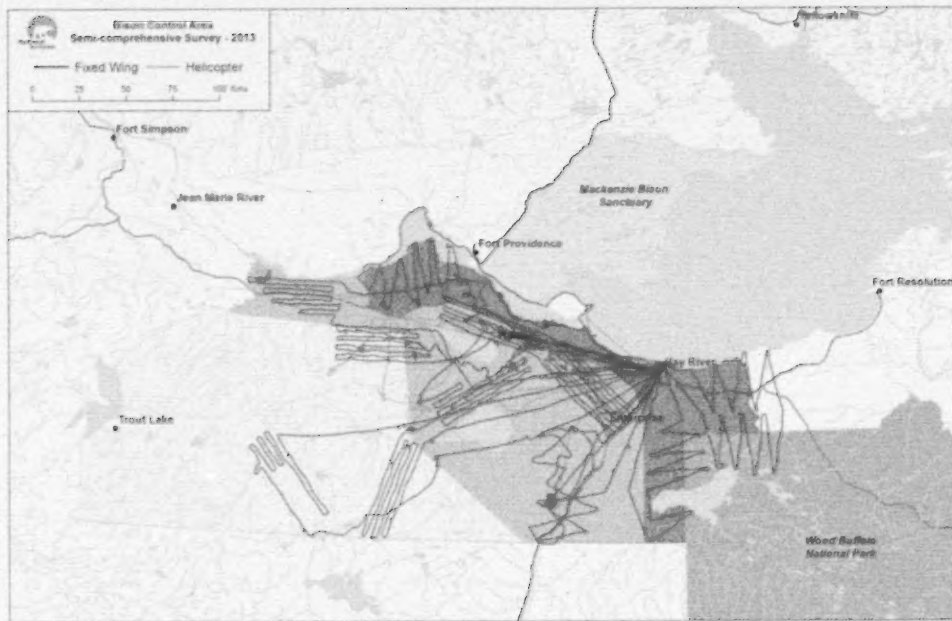


Figure 5. Routes followed during the semi-comprehensive survey. The intensive flight lines that did not follow the usual semi-comprehensive survey route were part of the boreal caribou program.

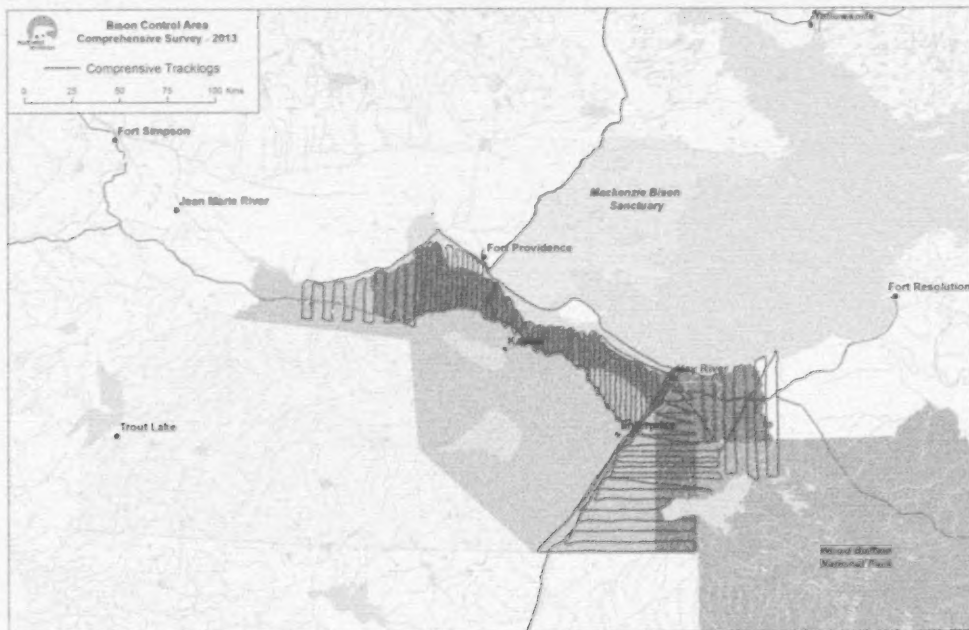


Figure 6. Routes followed during the comprehensive survey. Due to the extensive coverage of this year's semi-comprehensive survey, the comprehensive survey area in the zone II section of the BCA was reduced.

During all surveys, any tracks and wildlife observed were documented and their location recorded. If any tracks appeared like they might be bison tracks the aircraft would circle so that observers could take a better look to determine the type of tracks. Data recording was done with handheld GPS and datasheets.

RESULTS

During the 2012/2013 season, there were three reports of bison either entering or approaching the BCA. None of these cases required removals and were investigations only. A total of 92.7 hrs of fixed wing surveys were conducted over 22 days (Tables 1, 2). This time includes fixed wing surveys that were conducted as part of the boreal caribou surveys which were all flown within the BCA. All bison observations and their tracks observed during the surveys were seen north of the Mackenzie River, outside of the BCA. Weather conditions were recorded for each survey flight (Appendix B). Weather conditions were acceptable for most of the survey days. If the light or weather conditions were exceptionally poor the flight would be terminated or delayed until the next day.

The boreal caribou collaring crew also flew over 30 hrs in the BCA with a helicopter February 13-17, 2013, and did not observe any bison or bison sign.

SHORELINE PATROLS

During all of the shoreline patrols a total of 227 bison, two moose, and 19 wolves were observed (Table 1, Figure 7). The weekly shoreline patrols began on January 4, 2013 and finished on April 17, 2013. Shoreline patrols were not always completed at regular intervals due to staff availability, weather and Landa Aviation's schedule. Total flight time for the twelve shoreline patrols was 38.9 hrs with a mean duration of 3.2 hrs (Table 2). These times include ferry time between Hay River and Fort Providence which was approximately 1.0 hrs/flight. Ferry times should also be taken under consideration when discussing detection effort since these

positioning flights are through the BCA and the pilots are also considered to be valuable observers.

Table 1. All recorded observations of animals and tracks seen during the shoreline surveys.

Shoreline Surveys	Bison	Moose	Caribou	Caribou Tracks	Wolf	Large Mammal Kill Site
4-Jan	36	0	0	0	9	1
10-Jan	32	0	0	0	10	1
18-Jan	15	1	0	0	0	0
25-Jan	33	1	0	0	0	0
21-Feb	16	0	0	0	0	0
28-Feb	No data available*					
7-Mar	25	0	0	0	0	0
15-Mar	31	0	0	1	0	0
28-Mar	Poor weather – flight aborted					
4-Apr	9	0	0	0	0	0
10-Apr	20	0	0	0	0	0
17-Apr	10					
Total	227	2	0	1	19	2

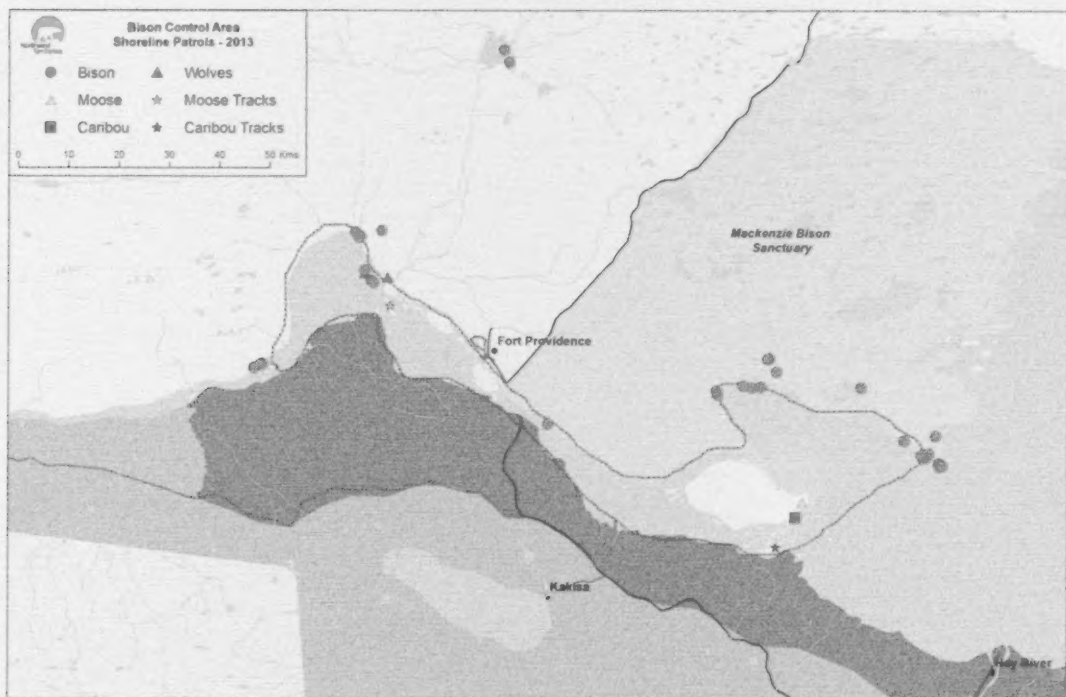
*Survey was completed; however datasheets were lost before data entry occurred. Flight time is included in the totals. The observer reported that no bison were observed.

Table 2. Summary of BCA Shoreline surveys for the 2012/2013 season.

Survey	Date	Hrs Flown	Survey	Date	Hrs Flown
1	4-Jan	3.9	7	7-Mar	3.5
2	10-Jan	4.4	8	15-Mar	3.0
3	18-Jan	3.4	9	28-Mar ¹	1.2
4	25-Jan	3.2	10	4-Apr	3.0
5	21-Feb	3.4	11	10-Apr	3.4
6	28-Feb	3.5	12	17-Apr	3.0

Total hrs on survey = 38.9 (includes positioning aircraft between Hay River and Fort Providence which is usually 1.0 hrs/flight).

¹ Flight terminated due to poor weather west of Fort Providence.

**Figure 7.** Recorded observations of bison during the shoreline patrols. The blue dotted line indicates the approximate route followed for the weekly shoreline patrols

The final shoreline patrol of the 2012/2013 season was flown on April 17, 2013. Ice conditions were deteriorating at this time and by the end of the following week ice conditions were expected to degrade very quickly and deter bison from crossing the Mackenzie River.

TRANSECT SURVEYS

A total of 23 bison, 49 moose, 85 boreal caribou, and 10 wolves were observed during the semi-comprehensive fixed wing surveys (Table 3). The semi-comprehensive survey was combined with a series of reconnaissance flights for a boreal caribou collaring program. This provided a much greater coverage of the BCA area and shared other costs with the boreal caribou program. The survey was started on February 5, 2013 but was delayed after a weather system moved in after only two days of flying. The survey resumed on February 12 and continued until February 16. This survey covered approximately 7,720 km of fixed wing flying. This equates to an estimated 19.4% coverage of the BCA assuming an average transect width of 500 m on each side of the aircraft. Last season there were 2,960 km (7.4% coverage) of transects lines flown. This year there was also 2,537 km of helicopter flying by the collaring crew (February 13-17, 2013) (Table 4). Observations from the helicopter crew are not included in this dataset; however there were no bison or bison sign observed by the helicopter crew. Locations of bison and bison tracks observed during the fixed wing portion of the semi-comprehensive survey are summarized in Table 3 and Figure 8.

Table 3. All recorded observations of animals and tracks seen during the semi-comprehensive survey, February 5-16, 2013. The track counts are counts of the occurrences of tracks and not an estimation of animals. Helicopter observations are not included.

Semi-Comprehensive Survey	Total
Bison	23
Bison tracks	0
Moose	49
Moose tracks	53
Boreal caribou	85
Boreal caribou tracks	68
Unknown large mammal tracks	3

Table 4. Summary of BCA transect surveys for the 2012/2013 season.

Survey	Date	Hrs Flown
Semi-comprehensive	5 Feb 2013	4.6
	6 Feb 2013	5.5
	12 Feb 2013	7.0
	13 Feb 2013	6.6
	14 Feb 2013	6.4
	15 Feb 2013	5.2
	16 Feb 2013	0.6
Semi-comprehensive total:		35.9
Comprehensive	18 Mar 2013	4.4
	19 Mar 2013	7.0
	20 Mar 2013	6.5
Comprehensive total:		17.9

The comprehensive survey was flown between March 18 and 20, 2013 (Table 4). The area covered in this survey was reduced this year due to the extensive coverage provided by the semi-comprehensive survey and the boreal caribou collaring program. This survey took 17.8 hrs to complete (Table 4). Over 4,132 km of transect lines were flown, with an estimated 10.4%

coverage of the BCA (based on 500 m transect width on each side of the aircraft). During the comprehensive survey five bison, 12 moose, and three boreal caribou were observed (Table 5). Locations of bison and bison tracks observed during the comprehensive survey are summarized in Figure 9.

Table 5. All recorded observations of animals and tracks seen during the comprehensive survey, March 18-20, 2013. The track counts are counts of the occurrences of tracks and not an estimation of animals.

Comprehensive Survey	18-Mar	19-Mar	20-Mar	Total
Bison	0	0	5	5
Bison tracks	0	0	1	1
Moose	3	5	4	12
Moose tracks	44	56	24	124
Boreal caribou	0	0	3	3
Boreal caribou tracks	6	2	27	35

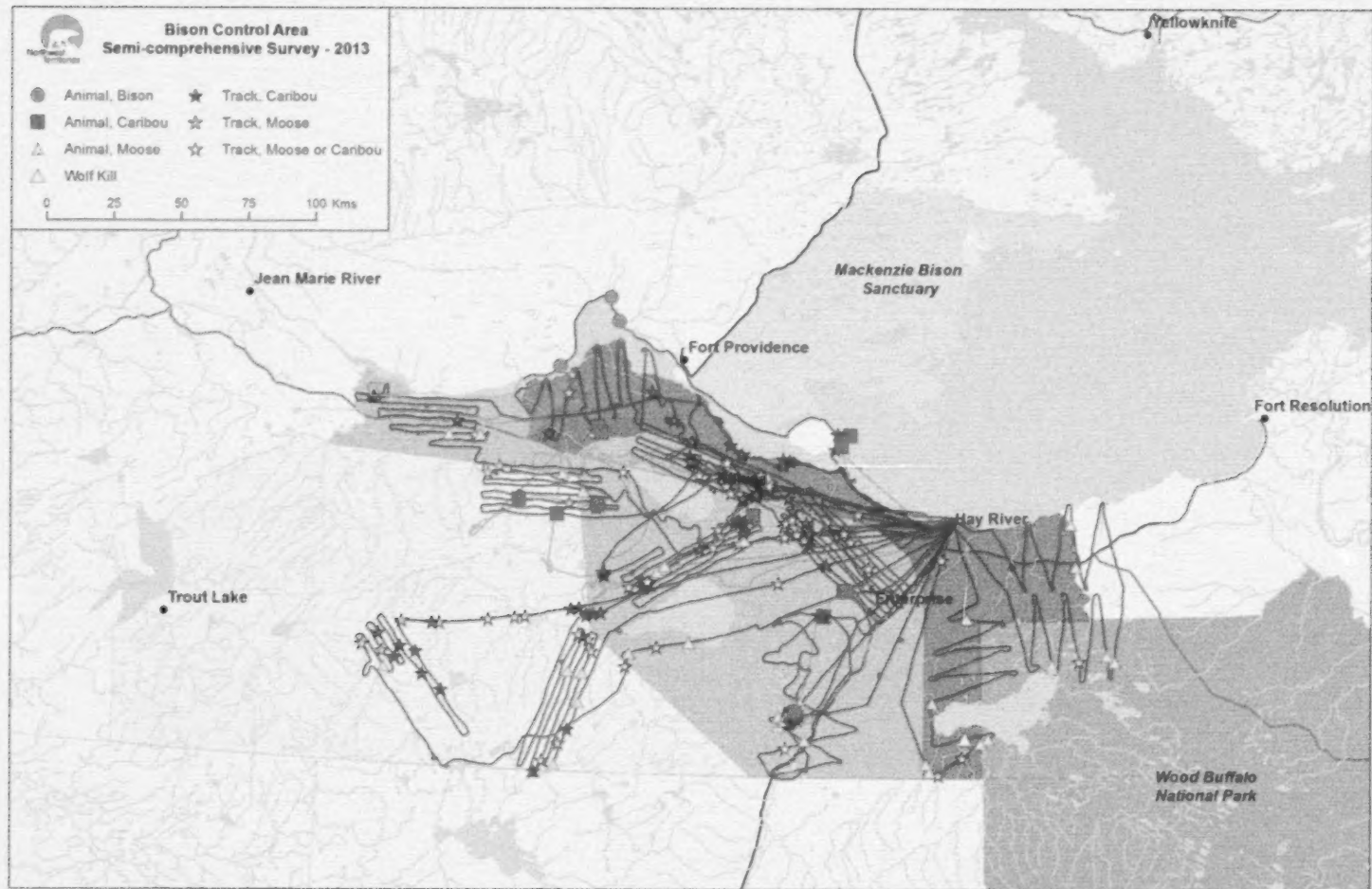


Figure 8. All bison and bison track observations recorded during the semi-comprehensive survey, February 5-19, 2013.

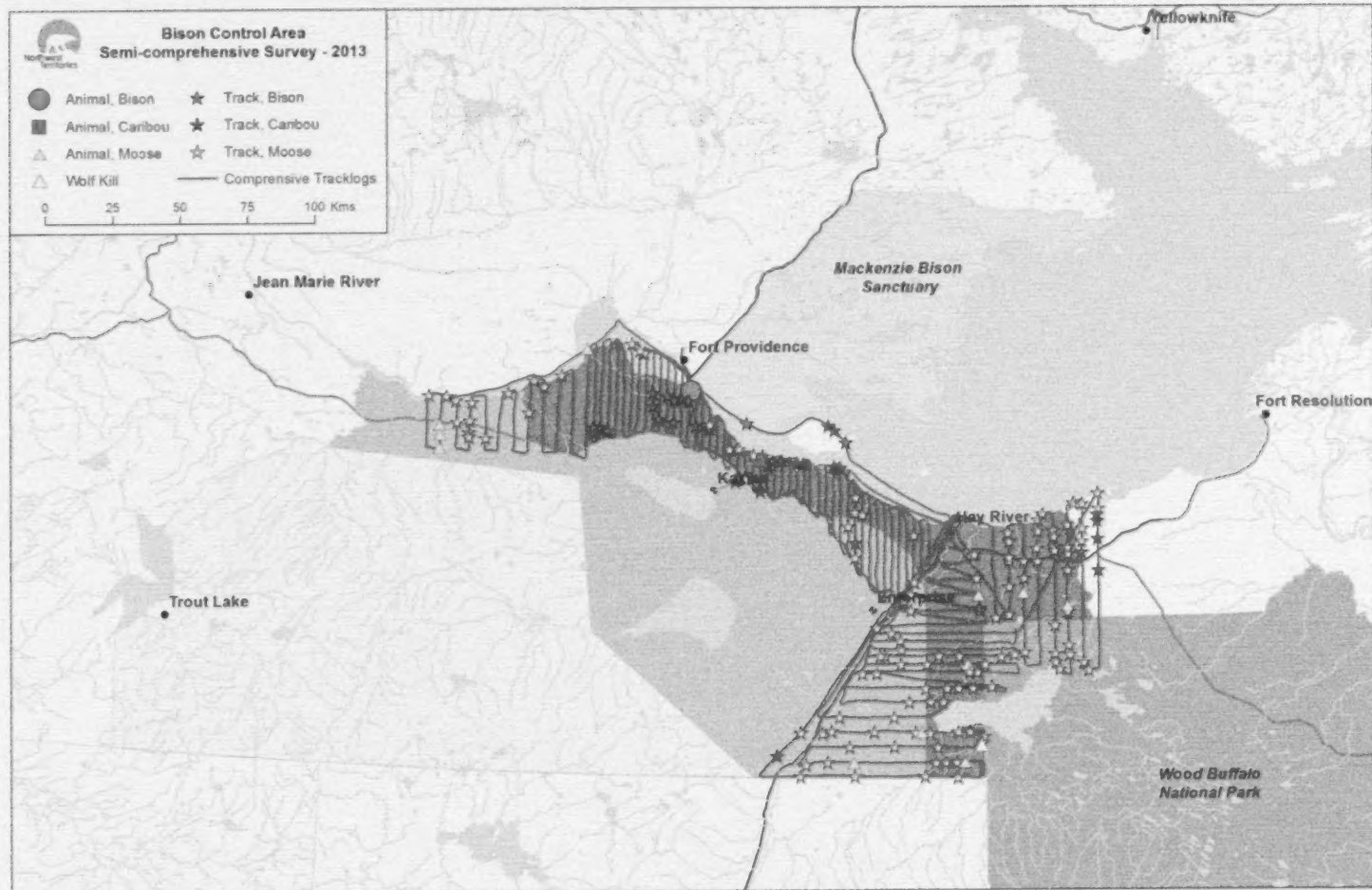


Figure 9. All bison and bison track observations recorded during the comprehensive survey, March 18-20, 2013.

PUBLIC AWARENESS

This year, there were fewer public awareness actions than in prior years, in part due to timing and resource difficulties encountered when dealing with the Mackenzie bison anthrax outbreak in 2012. The installation of new signage where highways cross BCA boundaries was completed. An article on the BCA was published in the June 29, 2012 edition of Bearfacts, a newsletter distributed to all Government of the Northwest Territories (GNWT) employees (see Appendix C). Media advertising via newspapers and radio will resume next year.

BISON REPORTS

There were three reports of bison in the BCA this season. Each report was investigated by ENR staff and no bison were located.

Bison Sightings:

- 1) August 26, 2013: Renewable Resource Officer (RRO) Danny Beaulieu in Fort Providence received a report of six bison on Meridian Island (just south of Fort Providence). The area was inspected by helicopter on the following day with no other sightings. Meridian Island was searched again by helicopter on September 18 and no signs of bison were found.
- 2) January 23, 2013: A community member from Fort Providence informed RRO Danny Beaulieu that he had observed three bison walking across the ice towards the south shore near the healing lodge, and that he had herded the animals back to the north shore with a snowmobile. There were a couple more animals observed on the north shore as well. RRO Edward Landry conducted a snowmobile patrol of the area on the same day. RRO Landry found the bison

tracks and followed them into the community of Fort Providence where he found four bison cows. The animals were then herded north of the community.

- 3) A community member from Fort Providence filed a report with Fort Providence ENR RROs on March 21, 2013. He reported that bison had crossed the Mackenzie River via a snowmobile trail at the Mills Lake/Horn River area. A flight was immediately arranged and an officer patrolled the area in question the same afternoon but did not locate any bison. The comprehensive survey had just finished surveying that area on March 20, 2013 and no bison were located. There were some tracks in the area of the snowmobile trail but upon inspection from the air they were determined to be moose tracks. The total flight time was 1.8 hrs, including approximately 1 hr for the aircraft to ferry to/from Hay River.

DISCUSSION

The number of bison and moose observed during shoreline patrols in 2012/2013 was substantially lower than previous years (Figure 10, Table 6). A contributing factor to this may be the major outbreak of anthrax in the Mackenzie Bison Sanctuary in the summer of 2012, during which 440 bison carcasses were found. Population surveys of the Mackenzie bison herd estimated it to be roughly half the size in March 2013 as it was March 2012 (714 bison in 2013, compared to 1,531 [standard error (SE) 257] bison in 2012 and 1,555 (SE 146) bison estimated in 2008). Fewer bison in the Mackenzie herd is likely a factor in the number of bison counted. However, it is probably not the only factor. Bison distribution on the landscape can change from year to year due to changes in habitat or other conditions. Because the shoreline surveys occur along a fixed route, if bison move away from the Mackenzie River, the number of bison observed during the survey would decrease even if the bison population size was stable. The same bison can be counted repeatedly in subsequent weeks so a large herd that spends the winter along the shoreline patrol route can have a large impact on the number of bison observed.

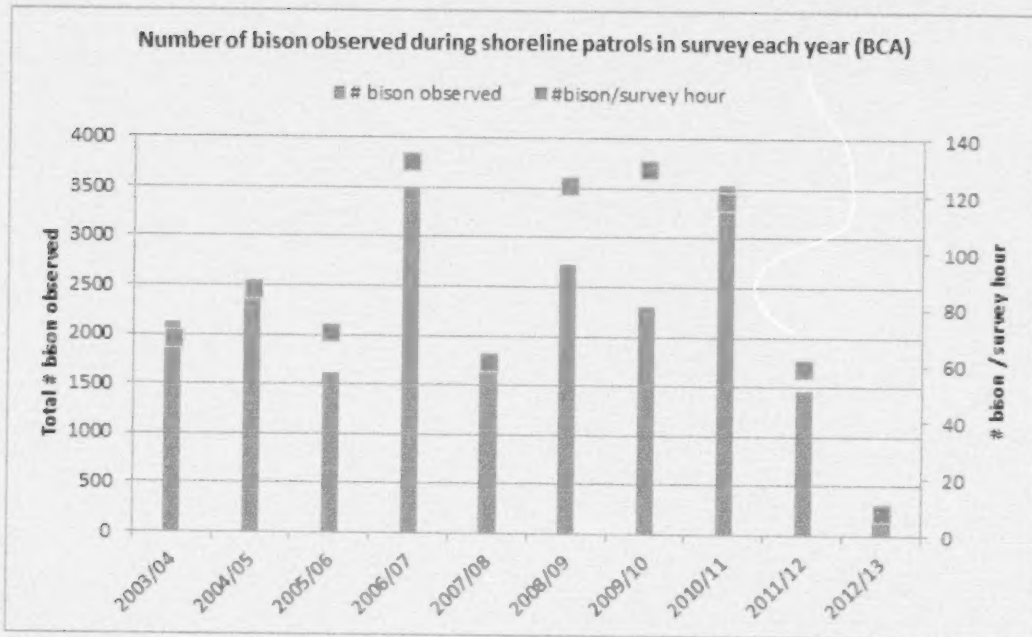


Figure 10. Number of bison observer during shoreline patrols.

Table 6. Comparison of current and prior observation counts.

Year	Number of Flights	Survey Hours	Observation Counts			Bison / Survey Hours
			Bison	Moose	Wolf	
2012/13	12	26.9	227	2	19	8.4
2011/12	10	24.8	1,461	49	36	58.9
2010/11	11	29.9	3,534	34	30	118.2
2009/10	9	17.8	2,310	50	37	129.8
2008/09	11	22.1	2,730	96	52	123.5
2007/08	12	27.7	1,695	61	3	61.2
2006/07	12	26.5	3,496	43	6	131.9
2005/06	11	22.8	1,614	63	9	70.8
2004/05	12	28.9	2,493	97	7	86.3
2003/04	13	30.9	2,119	69	9	68.6

BISON REVIEW

A review of the BCA is currently being conducted to assess effectiveness of the program and to identify any potential cost savings. Recommendations will be taken into consideration for future BCA activities.

ACKNOWLEDGEMENTS

Several people were integral to the smooth running of the BCA program for the 2012/2013 season. Renewable Resources Officers Edward Landry, Danny Beaulieu, Cheyenne Paulette, and Terrance Campbell, and ENR staff Dallas Phillips and Allicia Kelly, assisted in various survey flights.

The community observers were indispensable and we thank all of them for assisting on our surveillance flights: Pat Martel and John Mandeville of Hay River. Many thanks also go to Landa Aviation Ltd. and their pilots Darcy King and Tyler King for their expertise and input as well as help that went beyond the requirements of their job. Karl Cox, South Slave Wildlife Technician, managed the 2012/2013 BCA program and compiled this report. Thank you to Allicia Kelly and Terry Armstrong for reviewing earlier drafts of this manuscript.

LITERATURE CITED

- Bidwell, W., J.S. Nishi and T.R. Ellsworth. 2004. Bison Control Area Program Annual Report of Survey Activities, December 2003 – April 2004. Resources, Wildlife and Economic Development, Government of the Northwest Territories. Manuscript Report No. 156. 50pp.
- Bohnet, S. and C.C. Gates. 1997. Bison Control Program: Annual Report of Survey Activities, December 1996 – April 1997. Resources, Wildlife and Economic Development, Government of the Northwest Territories. Manuscript Report No. 100. 33pp.
- Boulanger, A.J.M., T.R. Ellsworth, and J.S. Nishi. 2002. Bison Control Program: Annual Report of Survey Activities, December 1997 – April 1998. Resources, Wildlife and Economic Development, Government of the Northwest Territories. Manuscript Report No. 110. 37pp.
- Campbell, G.D., J.S. Nishi and T.R. Ellsworth. 2004. Bison Control Area Program Annual Report of Survey Activities, December 2002 – April 2003. Resources, Wildlife and Economic Development, Government of the Northwest Territories. Manuscript Report No. 155. 35pp.
- Gates, C.C., B. Elkin, L. Kearey and T. Chowns. 1992. Surveillance of the Bison Free Management Area. Renewable Resources, Government of the Northwest Territories. Manuscript No. 50. 29pp.
- Greig, R. and K. Cox. 2012. Bison Control Program: Annual Report, December 2010 – April 2011. Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report No. 215. 34pp.
- Hartop, B.V., W. Mandeville, N. Lee and D. Johnson. 2009. Bison Control Area Program Annual Report of Survey Activities November 2007 – April 2008. Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report 205. 75pp.
- Nishi, J.S. 2002. Surveillance Activities under the Northwest Territories Bison Control Area Program (1987-2000). Resources, Wildlife and Economic Development, Government of the Northwest Territories. Manuscript Report No. 145. 32pp.
- Sayine-Crawford, H., B. Hartop, and T. Armstrong. 2012. Bison Control Area Program Annual Report of Survey Activities December 2008-2009. Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report No. 213. 40pp.
- Williamson, K, C.C. Gates and A. Allisiak. 1995. Surveillance of the Bison Control Area, January – April 1994. Renewable Resources, Government of the Northwest Territories. Manuscript No. 82. 48pp.

APPENDIX A: SUMMARY OF SURVEILLANCE ACTIVITIES AND REMOVALS OF BISON FROM THE NORTHWEST TERRITORIES BISON CONTROL AREA (1988/1989 – 2011/2012)

Year	Shoreline Patrols	Semi-Comprehensive Surveys	Comprehensive Surveys	Total Hrs	Snow-mobile Ground Patrols	Bison Removals
1988/89	1					
1989/90	2					
1990/91	2					
1991/92		7				
1992/93			3			9 ^a
1993/94	14 ^b		1		23	
1994/95	10(26) ^c	6(94)	1(34)	153	33	2 ^d
1995/96	11(35)	3(48)	1(41)	123		3 ^e
1996/97	21(62)	3(45)	1(46)	153		
1997/98	14(43)	3(46)	1(48)	137		
1998/99	14(43)	2(30)	1(45)	117		
1999/00	14(42)	2(28)	1(46)	115		
2000/01	13(40)	2(30)	1(50)	120		
2001/02	14(42)	2(29)	1(42)	113		
2002/03	11(25)	2(22)	1(40)	87		
2003/04	13(31)	1(11)	1(37)	78		
2004/05	12(29)	1(14)	1(33)	76		
2005/06	11(23)	1(14)	1(36)	88		
2006/07	12(38)	1(19)	1(36)	93		
2007/08	13(40)	1(15)	1(33)	88		
2008/09	11(33)	1(15)	1(30)	78		
2009/10	9(27)	1(13)	1(13)	53		
2010/11	11(30)	1(17)	1(27)	74		1 ^f
2011/12	10(25)	1(16)	1(23)	64		
2012/13	12(27) (27.xx)	1(36)	1(18)	82	1 ^g	

^a 17 May 1992: 8 bulls shot near Point de Roche.

31 May 1992: 1 bull shot near Point de Roche (no lymph nodes collected). Serological testing for *Brucella* was negative for all 9 bulls, no lesions consistent with tuberculosis observed on gross pathology or histopathology.

^b Four patrols covered the Hay River area and extended inland to the northwest park boundary.

^c Numbers in brackets represent survey hours (rounded off to the nearest hour).

^d 13 October 1994, prior to the surveillance season beginning, 1 bison shot by hunter near the eastern boundary of the BCA. Blood and tissue samples collected but no evidence of brucellosis or tuberculosis.

8 March 1995, 1 cow shot by hunter along south shore of Mackenzie River. Cow had likely been wounded by wolves. Blood serum and retropharyngeal lymph nodes collected.

^e 19 March 1996: 3 cows killed by hunter on the south shore of Mackenzie River. Blood serum (n=2) and retropharyngeal lymph nodes (n=3) collected. No serological reactors to brucella, and lymphatic tissue normal on gross examination.

^f 5 January 2011: 1 injured young of the year female was killed by a fisherman north of Hay River on Great Slave Lake (coordinates: 60° 59' 17.1" N, 115° 51' 05.5" W). It was collected on January 12th and brought back to Fort Smith. A necropsy was performed and wounds were found on the front left shoulder and the hindquarters and appeared to be from a wolf attack. Retropharyngeal, submandibular, prefemoral, prescapular, popliteal and bronchial lymph nodes and tonsils were collected for testing.

^g Snowmobile patrol conducted from Fort Providence to investigate bison sighting. No bison observed.

**APPENDIX B: WEATHER CONDITIONS DURING THE BCA PROGRAM,
SEASON 2012-2013**

Table B.1. Weather data during the shoreline patrols.

Patrol	Date	Temp* (°C)	Winds* (kph)	Sky	Light	Intensity	Snow Cover
1	4-Jan	-20	6 kph @ 150°	Overcast	Flat	NA	Complete
2	10-Jan	-28	9 kph @ 220°	Clear	Bright	High	Complete
3	18-Jan	-25	15 kph @ 020°	Scattered	NA	NA	Complete
4	25-Jan	-27	4 kph @ 290°	NA	NA	NA	NA
5	21-Feb	-12	9 kph @ 300°	Overcast	Flat	Low	Complete
6	28-Feb	-7	4 kph @ 150°	NA	NA	NA	NA
7	7-Mar	-24	9 kph @ 070°	Overcast	Flat	Medium	NA
8	15-Mar	-27	9 kph @ 320°	Clear	Bright	High	Complete
9	28-Mar	-7	13 kph @ 090°	NA	NA	NA	NA
10	4-Apr	-18	13 kph @ 320°	NA	NA	NA	NA
11	10-Apr	8.6	24 kph @ 240°	Broken	Bright	High	Complete
12	17-Apr	-3	32 kph @ 070°	Overcast	NA	Medium	Complete

* Weather data from Environment Canada – Hay River Airport at 12:00 hrs.

Table B.2. Weather data during the semi-comprehensive and comprehensive surveys

Date	Survey	Temp (°C)	Winds (kph)	Sky	Light	Intensity	Snow Cover
5 Feb	Semi	-20	NE @ 5	Scattered	Bright	Medium	Complete
6 Feb	Semi	-21	SE @ 5	Scattered	NA	Low	Complete
12 Feb	Semi	-11	NA	Overcast	Flat	NA	Complete
13 Feb	Semi	-16	Calm	Overcast	Flat	NA	Complete
14 Feb	Semi	-20	Calm	Clear	Bright	High	Complete
15 Feb	Semi	-4	SE @ 7	Scattered	Bright	Medium	Complete
16 Feb	Semi	-14	NE @ 15	Overcast	Flat	Low	Complete
18 Mar	Semi	-22	NW @ 5	Clear	Bright	High	Complete
19 Mar	Comp	-30	Calm	Clear	Bright	High	Complete
20 Mar	Comp	-18	SE @ 15G20	Broken	Bright	Medium	Complete

APPENDIX C: BEARFACTS NEWSLETTER: JUNE 29, 2012

Did you know... about the Bison Control Area?



New signs are being put up this summer on NWT Highways 1, 3 and 5 to remind people about the importance of reporting any bison seen within the Bison Control Area. It is part of the Bison Control Area program started by the GNWT in 1987. The program helps reduce the risk of contact between diseased and disease-free bison herds in the Northwest Territories. Bison in the Slave River Lowlands and Wood Buffalo National Park are infected with tuberculosis and brucellosis. Bison in the Mackenzie and Nahanni herds are disease-free and the program helps protect the health of these two wood bison populations.

The Bison Control Area program establishes a zone between the diseased and disease-free herds. The objectives of the program are to detect and remove any bison in the control area and to keep bison from becoming established in it. The boundaries for the control area are the NWT border in the south, the Mackenzie River in the north, the Trout River in the west and the Buffalo River in the east. The Department of Environment and

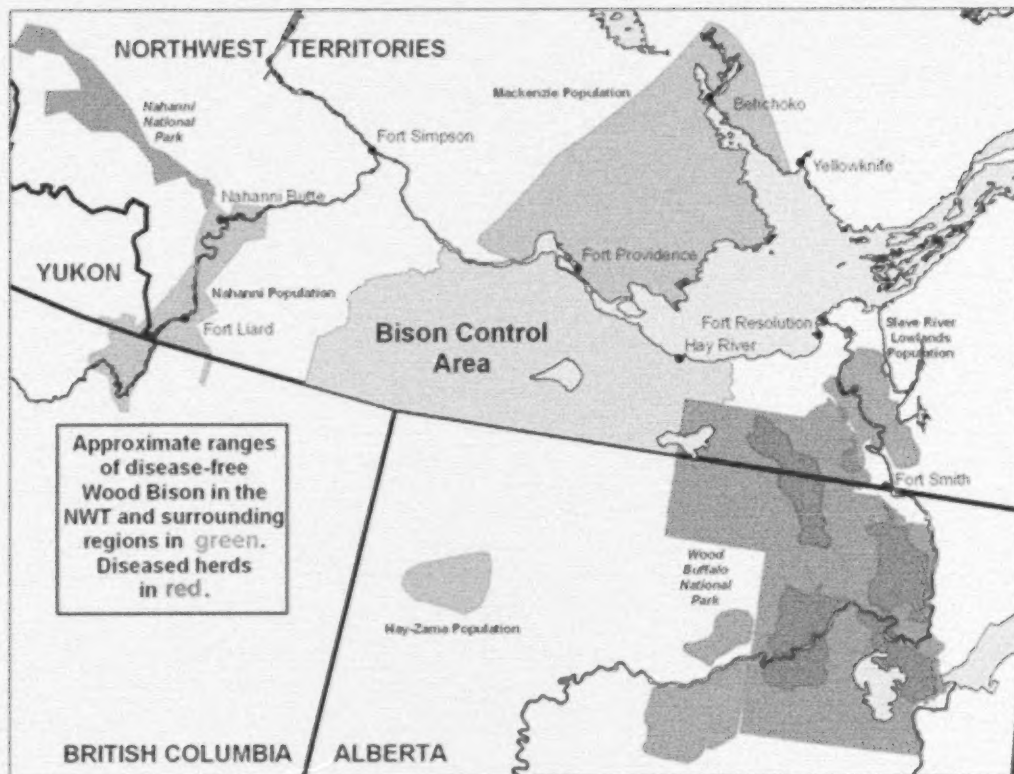
Natural Resources monitors the Bison Control Area and any public reports are an important part of the program.

If you see a bison in this area, please report it as soon as possible to the nearest ENR office or call the toll-free number 1-866-629-6438. The success of this program depends on the public and the cooperation of people like you.

The Bison Control Area is cost-shared with Parks Canada. For more information, [click here](#) to visit ENR's website.



Keep an eye out for the new Bison Control Area signs as you travel this summer and help conserve our wildlife resources!



APPENDIX D: 2012-2013 BCA EXPENSES

Description	Expense
Air Charters*	\$50,987.50
Travel and Accommodations	\$2,436.55
BCA Technician/Observers – Wages	\$6,239.09
ENR - In Kind Support	\$20,463.08
Advertising	\$0
Total	\$79,524.02

*Does not include the additional air charter hrs for the boreal caribou fixed wing reconnaissance (\$15,059.75).

The semi-comprehensive survey was composed of the BCA funded portion (\$9,422.50) and the boreal caribou funded portion (\$15,059.75). Annual expenses were substantially lower than budgeted in 2012/2013 for several additional reasons including but not limited to: cost-sharing with the GNWT boreal caribou program, no radio or newspaper advertising and no bison removals. A dedicated bison technician was also not hired for 2012/2013 as GNWT was able to allocate staff resources to managing the program this year.

APPENDIX E: BIBLIOGRAPHY

- Antoniak, R., and C.C. Gates. 1995. Surveillance of the Bison Control Area, December 1994 – March 1995. Department of Renewable Resources, Government of the Northwest Territories. Manuscript Report No. 84. 67pp.
- Animal, Plant and Food Health Risk Assessment Network (APFRAN). 1998. Risk Assessment on Bovine Brucellosis and Tuberculosis in Wood Buffalo National Park and Area. 41pp.
- Carbyn, L.N., S.M. Oosenbrug, and D.W. Anions. 1993. Wolves, Bison and the Dynamics Related to the Peace-Athabasca Delta in Canada's Wood Buffalo National Park. Canadian Circumpolar Institute.
- Corner, A.H. and R. Connell. 1958. Brucellosis in bison, elk and moose in Elk Island National Park, Alberta, Canada. Canadian Journal of Comparative Medicine 22: 9-21.
- Fuller, W.A. 1959. The biology and management of the bison of Wood Buffalo National Park. Ph.D. Thesis, University of Wisconsin, Madison, WI.
- Fuller, W.A. 2002. Canada and the "buffalo", *Bison bison*: A tale of two herds. Canadian Field-Naturalist 116: 141-159.
- Gates, C.C., J. Mitchell, J. Wierzchowski and L. Giles. 2001. A landscape evaluation of bison movements and distribution in Northern Canada. Axys Environmental Consulting Ltd., Calgary, AB. 113pp.
- Gates, C.C. and J. Wierzchowski. 2003. A landscape evaluation of bison movements and distribution in Northern Canada (Addendum to the final report dated December 2001). 18pp.
- Graham, M. 1923. Canada's wild buffalo. Canadian Department of the Interior, Ottawa, ON. 12pp.
- Greig, R. K. Cox, and H. Sayine-Crawford. 2012. Bison Control Area Program Annual Report of Survey Activities December 2009 – April 2010. Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report No. 214. 30pp.
- Greig, R. and K. Cox. 2012. Bison Control Program: Annual Report, December 2010 – April 2011, Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report No. 215. 34pp.
- Joly, D.O. and F. Messier. 2004. Factors affecting apparent prevalence of tuberculosis and brucellosis in wood bison. Journal of Animal Ecology 73: 623-631.
- Larter, N.C. and D.G. Allaire. 2007. History and Current Status of the Nahanni Wood Bison Population. Environment and Natural Resources, Government of the Northwest Territories. File Report 136. 44pp.

- Sayine-Crawford, H., B. Hartop, and T. Armstrong. 2012. Bison Control Area Program Annual Report of Survey Activities December 2008-2009. Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report No. 213. 40pp.
- Soper, D. 1941. History, range and home of the northern bison. *Ecological Monographs* 2: 347-412.
- Tessaro, S.V., L.B. Forbes and C. Turcotte. 1990. A survey of brucellosis and tuberculosis in bison in and around Wood Buffalo National Park, Canada. *Canadian Veterinary Journal* 31: 174-180.
- Tessaro, S.V., C.C. Gates and L.B. Forbes. 1993. The Brucellosis and Tuberculosis Status of Wood Bison in the Mackenzie Bison Sanctuary, Northwest Territories, Canada. *Canadian Journal of Veterinary Research* 57: 231-235.